May 22, 2025

To: Andrea Harbin Monahan, Colorado Water Conservation Board (CWCB)

From: The Watershed Center (formally Lefthand Watershed Oversight Group)

Re: CWCB Watershed Restoration Grant – Adaptive Management at Scale – Final Report (PDAA 2020*2968)

The purpose of this memo is to provide a final report on activities related to The Watershed Center's Adaptive Management at Scale project. The project timeline is 05/26/2020 – 05/26/2025, and the total project budget is currently $805,289.00 with $382,320.00 from the CWCB Watershed Restoration Grant.

1. Project summary and how the project was completed

Over the last five years, Adaptive Management at Scale has been foundational to building regional knowledge of ecosystem health and the value of long-term monitoring and fostering collaborative relationships among local and regional partners. Our primary goal of this project was to develop and use this shared framework collaboratively, with input from diverse partners that manage and monitor watershed health throughout the St. Vrain Basin. To achieve this goal, we 1) worked with partners to assess watershed health data collection efforts throughout the basin in order to understand what was collected, where there was overlap, and where there were gaps; 2) worked with partners to document, research, and refine watershed health indicators; 3) developed a shared framework for adaptive management that complimented existing data collection efforts and integrated existing watershed management plans and tools; and 4) implement the framework, reported results in "State of the Watershed" reports, held collaborative meetings and workshops, and iterated the adaptive management process by updating the framework based on what was learned.

We are grateful to the Colorado Water Conservation Board for the funding, technical assistance, and other support that has made this project a success and a model for other watersheds to collaborate and collect valuable ecological and geomorphological data to prioritize and identify watershed resilience projects.

2. Obstacles encountered and solutions

Throughout this project, we faced key obstacles that changed our project approach. These obstacles and resulting solutions are described in the table below.

Obstacle encountered	Solution
Indicator prioritization	We envisioned that partners would support implementing a wide array of indicators to capture diverse environmental conditions. We found that very few indicators

	suited all partners because different partners had different management priorities depending on their expertise. To address this obstacle, we chose to focus on top-level indicators that were responsive to various drivers of environmental change, such as benthic macroinvertebrates, with follow up monitoring recommendations of specific indicators (e.g., water chemistry) when issues were identified.
Lack of cohesion around monitoring methods	We envisioned that partners would be supportive of adopting similar indicator methods to make for efficient data comparison. However, we found that partners frequently used different methods to evaluate the same indicators because methods were institutionalized within their own monitoring programs. We overcame this obstacle by choosing to use variations of known methods that would still provide important but also fit within our own capacity limitations. Doing this, we were able to compare end metrics with metrics partners collected even if the methods to arrive at those metrics were slightly different.
Collaborative monitoring approach	We envisioned that partners would offer capacity to support monitoring of the priority indicators to support for a broad understanding of watershed-wide health and functioning. However, we found that partners were challenged to provide capacity for this effort outside of their management-specific priorities. To overcome this obstacle, The Watershed Center filled capacity gap needs to support the larger basin monitoring and we incorporated partner data where possible.
Monitoring frequency	We found that despite selecting effective indicators of desired conditions, their difficulty to collect varied in expertise and capacity. To address this, we adjusted monitoring frequency based on expected changes. For instance, floodplain connectivity, unlikely to shift annually unless a major event occurred, was monitored less frequently. Meanwhile, more variable indicators (e.g., benthic macroinvertebrates) remained annual. This flexible approach allowed us to adapt quickly to new events like wildfires.
Project prioritization approach	We envisioned that long-term data from this project would directly identify and prioritize restoration projects. While the data successfully highlighted key issues and informed management recommendations, we found that prioritizing specific projects required alignment with partners' internal priorities and existing project plans. We realized that successful project implementation depends equally on collaboration, expertise, and scientific data. In response, we strengthened coordination by creating or expanding working groups focused on specific topics. These groups have since worked to identify and prioritize projects that align both with our findings and partner priorities.
Reporting approach	We initially planned to release full State of the Watershed reports annually, covering all monitored indicators from the previous year. However, this proved too frequent and too much information. These reports contained too much information at once, making it difficult for partners to digest and act on key findings. Producing full reports each year also stretched our capacity away from collaboration and other priorities. To address this, we shifted to annual interim reports focused on key findings of a specific indicator or area of the Basin and management recommendations. This flexible approach made information more accessible and actionable while allowing us to prioritize emerging needs and data gaps.
Community State of the Watershed report	Generating community reports alongside technical reports did not always generate strong engagement. To improve outreach, we began sharing community reports strategically through newsletters and at engagement events (e.g., the local Water Fair or Watershed Days). These events proved especially effective, as they attracted non-technical but highly interested audiences eager to learn about local watershed issues.

Collaborative meeting format	We initially envisioned our annual collaborative meeting as a workshop-style event to engage partners in developing shared projects on a particular watershed priority. However, focusing on narrow topics in a room of diverse partners working across different systems was not effective or engaging. To improve engagement and relevance, we shifted to a conference-style format, featuring presenters sharing case studies and initiatives on key watershed priorities across grassland, forest, river systems. This approach has received overwhelmingly positive feedback and has maintained strong and diverse stakeholder participation for the past three years.
A shared process used by all partners	We envisioned partners actively contributing to the development of a shared collaborative adaptive management process. However, most partners had their own established processes and comprehensive plans, making it difficult to create a single shared approach. To address this, we integrated key elements of partner plans (e.g., collaboratively developed desired future conditions) into our process. This allowed partners to engage while maintaining their own frameworks. Ultimately, the shared process we developed became the foundation of how The Watershed Center engages partners in collaboration and science and has been adapted across systems and working groups focused on specific priorities.
Adaptive management plan for all systems	We envisioned creating a single adaptive management plan to guide collaborative monitoring and decision-making across forests, grasslands, and rivers in the St. Vrain Basin. However, we learned that each system required different applications of the collaborative process and that we could not address each system with a one size fits all approach. To address this, we applied the overarching adaptive management process in separate plans for forests, grasslands, and rivers. This approach allowed for tailored collaborative and monitoring strategies that met each system's unique needs while leveraging existing networks of practitioners and experts to maximize progress and success.

3. Deliverables and accomplishments

In order to achieve our project goals of 1) Understanding the types of watershed health data collected throughout the St. Vrain Basin, 2) Identifying watershed health indicators that are relevant and practical for adaptive management at the basin scale, 3) Developing a shared adaptive management framework for the St. Vrain Basin, and 4) Implementing the shared adaptive management framework, key accomplishments are described for each deliverable by task in the table below.

Deliverable	Accomplishments
Task 1 – Data Assessments	• Engaged more than 20 data collecting entities and 10 data plans to assess existing data collection efforts, identify data collection gaps, and prioritize areas and indicators for future data collection. Engagement led to the development of interactive map. • Engaged more than 60 partners and more than 250 community members across one partner-focused collaborative meeting and nine community-focused public meetings to document known ecological conditions, issues, and potential future projects. Engagement led to the development of interactive maps.
Data Assessments Memo (memo with linked maps)	
Task 2 – Watershed Health Indicators Assessments	
Watershed Health Indicators Assessments Memo (memo describing indicator selection process with linked framework)	

Task 3 – Shared Framework	• Hosted three annual collaborative meetings with one additional meeting in the planning phase, which each engaged over 60 representatives from more than 20 local and regional entities each year (2022, 2023, and 2024 agendas). • Developed six reports, StoryMaps, and technical memos describing watershed conditions and/or issues that were posted online and shared in newsletters and at public events to reach the broader community. • Led to the formation or expansion of more than 10 topic-specific working groups that aim to share information and prioritize projects. • Led to a boost in foundation of all working groups and the St. Vrain Forest Health Partnership by having staff dedicated to ensuring efficient collaboration among members across multiple entities. • Laid the ground work for future collaborative restoration work and ecological monitoring in the St. Vrain Basin by establishing stable and effective working groups, monitoring programs, prioritized lists of projects, and specific research and monitoring gaps. • Ensured continuation of work by establishing funding agreements between The Watershed Center and four local entities. • Established The Watershed as a community leader by developing community oriented State of the Watershed reports and participating in local water fairs and other community events (2023, 2024 community State of the Watershed reports). • Adaptive management process has resulted in ten projects that are in design or construction phases (five forest wildfire mitigation projects, one grassland management project, and four river restoration projects). • Successfully applied for and received two federal WaterSMART grants to support design and construction phases of prioritized projects.
Adaptive Management Plan for Rivers, Forests, and Grasslands (plan and framework) River and Riparian Adaptive Management 2025 Update	
Task 4 - Implementation	
2023 State of the Watershed Report* (report) 2024 State of the Watershed Pt. I Report* (report) 2024 State of the Watershed Pt. II Report* (report) 2024 Collaborative New Zealand Mudsnail Monitoring and Management StoryMap (StoryMap) 2025 Floodplain Connectivity Memo (technical memo) 2025 Upper Left Hand Watershed Water Quality Monitoring StoryMap (StoryMap) *reports include data from St. Vrain watershed that were collected using separate funding.	

4. Confirmation of matching commitments

Below we provide confirmation that all matching commitments have been fulfilled. Match sources included a combination of in-kind time from project partners, as well as cash match from Keep it Clean Partnership, Boudlr County Parks and Open Space, City of Boulder Open Space and Mountain Parks, Mile High Flood District, St. Vrain and Left Hand Water Conservancy District, Trout Unlimited Colorado Rivers Fund Grant, City of Boulder Small Grant Program, and US Bureau of Reclamation WaterSMART grants.

Cash match

	Income	Expense	Status
Task 1 – Data Assessments	$71,795.00	$71,795.00	Complete
Task 2 – Watershed Health Indicators	$45,375.00	$45,375.00	Complete
Task 3 – Shared Framework	$60,950.00	$60,950.00	Complete
Task 4 – Implementation	$204,849.00	$204,894.23	Complete

In-kind match

	Income	Expense	Status
Task 1 – Data Assessments	$10,000.00	$10,000.00	Complete
Task 2 – Watershed Health Indicators	$10,000.00	$10,000.00	Complete
Task 3 – Shared Framework	$10,000.00	$10,000.00	Complete
Task 4 – Implementation	$10,000.00	$10,000.00	Complete

5. Summary of key deliverables

Task 1 – Data Assessments

- Data Assessments Memo (memo with linked maps)

Task 2 – Watershed Health Indicators Assessments

- Watershed Health Indicators Assessments Memo (memo describing indicator selection process with linked framework)

Task 3 – Shared Framework

- Adaptive Management Plan for Rivers, Forests, and Grasslands (plan and framework)
- River and Riparian Adaptive Management 2025 Update

Task 4 – Implementation

- 2023 State of the Watershed Report (report)
- 2024 State of the Watershed Pt. I Report (report)
- 2024 State of the Watershed Pt. II Report (report)
- 2024 Collaborative New Zealand Mudsnail Monitoring and Management StoryMap (StoryMap)
- 2025 Floodplain Connectivity Memo (technical memo)
- 2025 Upper Left Hand Watershed Water Quality Monitoring StoryMap (StoryMap)